Version 2.0

Abstract

Grant Number: 5F31NR007504-02

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Project Title: THE EFFECTS OF LOWER EXTREMITY STRENGTH ON BALANCE

Abstract: Maintaining postural balance is a fundamental human task associated with health and functional ability. Problems with imbalance occur most frequently among the elderly with approximately one third of elders 65 years or older falling each year and almost 90 percent of hip fractures resulting from a fall. Despite investigations which have looked at exercise as a means of improving balance, the contribution of strength to balance control is poorly understood. The purpose of this research is quantify the relationship of lower extremity strength and balance across the lifespan. This study, a collaboration between NASA and the National Institute on Aging (NIA), will examine normal changes in sensory inputs and motor responses in balance control. Specific aims of this study are: (1) To determine if there is a difference in strength between fallers and non-falters in a healthy population. (2) To determine if there is a difference in measures of balance control between fallers and non-falters in a healthy population. (3) To determine the independent contribution of lower extremity strength to balance control and falls. (4) To determine if the contribution of strength to balance control and falls varies with age. Healthy men and women (N=280), ranging in age from 20-90, will be recruited from the Baltimore Longitudinal Study of Aging (BLSA). Using a cross-sectional design, subjects will undergo balance testing using the modified Equitest (NeuroCom, Clackamas, OR) NASA testing protocol and lower extremity strength testing using an isokinetic dynamometer (Kinetic Communicator model 125E Plus). Analyses will examine the individual and combined relationships between the dependent and independent variables. Results will establish the relative contribution of lower extremity strength to balance control enabling clinicians to identify high-risk elders and design exercise interventions.

Thesaurus Terms:
accidental fall, aging, balance, muscle strength, posture
age difference, gender difference, leg, neuromuscular function
clinical research, human subject

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Fiscal Year:	2001
Department:	NONE
Project Start:	25-SEP-2001
Project End:	
ICD:	NATIONAL INSTITUTE OF NURSING RESEARCH
IRG:	NRRC